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The Consequences of Mental Illness on Labor Market Decisions

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Abstract

The existing literature finds negative associations between mental illness and labor market outcomes. Using data from the 2007 to 2011 National Health Interview Survey, this study examines the consequences of emotional (depression, anxiety, or other emotional problems) and psychological (ADD, bipolar disorder, schizophrenia, or other mental problems) problems on four aspects of labor market decisions: the probability of participating in the labor force, the likelihood of working full time, the average number of hours worked per week and annual earnings. In addition to analyzing the effects of either having or not having a mental illness, I also test if there is a relationship between the duration of having a mental illness and labor market behaviors. I find evidence to show that having an emotional or psychological problem has an adverse impacts on all four aspects of labor market outcomes. Additionally, the results suggest that unconditional on having a mental illness, duration has statistically significant effects on labor market behaviors, while conditional on having a mental illness, statistical significance is not as prevalent.

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I. Introduction

The National Alliance on Mental Illness (NAMI) defines mental illnesses as mental conditions that often result in a diminished capacity for coping with the ordinary demands of life. They disrupt a person's thinking, feeling, mood and ability to relate to others. Individuals affected by a mental illness are not characterized by personal weakness, lack of character or poor upbringing; but rather, they are affected by a biological brain disorder that can affect persons of any age, race, religion or income. Fortunately however, most individuals diagnosed with a mental illness can recover with the appropriate individualized treatment and can lead productive and successful lifestyles, relatively unencumbered by their mental illness.[1]

In the United States, mental illness is one of the most prominent of all diseases, and mental disorders are among the leading causes of disability.[2] Specifically, Kessler et al. (2005b) estimate that 57.7 million Americans age 18 and older suffer from a diagnosable mental disorder in any given year. This translates to about one in every four adults and one in five children, as defined by Kessler et al. (2005b) and Koppelman (2004), respectively. Though mental disorders are spread out evenly across the population, Kessler et al. (2005b) suggest that a more serious form of mental illness, referred to as "serious mental illness" is concentrated in a much smaller population: one in 17 people suffer from a serious mental illness.

[1] "About Mental Illness," National Alliance on Mental Illness, Acceesed February 8, 2013, http://www.nami.org/template.cfm?section=about_mental_illness.

[2] "Mental Health," Healthy People, Last Modified Aptril 18, 2013, http://www.healthypeople.gov/2020/LHI/mentalHealth.aspx.

The National Institute of Mental Health (NIMH) defines a serious mental illness as a range of illnesses that include mood and anxiety disorders. Serious mental illnesses affect an individual's ability to function for at least a 30-day period over the course of a year and may cause suicidal tendencies or repeated acts of violence.[3] Examples of serious mental illness include major depression, schizophrenia-spectrum disorders, bipolar disorder, obsessive-compulsive disorder (OCD), panic disorder, posttraumatic stress disorder (PTSD) and borderline personality disorder.

Reeves et al. (2011) estimate that 26.2 percent of the US adult population currently lives with a mental health disorder, and 46 percent will develop one over the course of their lifetime. These figures suggest that mental health disorders are affecting individuals at an increasingly alarming rate. Thus, as the number of people affected by mental illness continues to increase, the economic losses associated with mental illness will grow proportionately.

Greenberg et al. (1990) indicate that the economic costs are measured as direct costs associated with medical, psychiatric and pharmacologic care; and indirect costs arising from suicides, medical morbidity, reduced responsiveness to treatment resulting in relapse and hospitalization, lost income due to unemployment and decreased productivity in the workplace. Casual empiricism suggests that mental illnesses and serious mental illnesses can have significant economic effects. Kessler et al. (2008) suggest that serious mental illnesses affect approximately six percent of American adults and cost our nation at least $193 billion in lost earnings alone. Further, the director of NIMH, Thomas Insel

[3] "Mental Disorders Cost Society Billions in Unearned Income," National Institutes of Mental Health, Last Modified May 7, 2008,"http://www.nimh.nih.gov/science-news/2008/mental-disorders-cost-society-billions-in-unearned-income.shtml.

(2008), estimates that serious mental illnesses cost our nation $317 billion annually – $100 billion in direct health expenditures, $193 billion in lost income and $24 billion in disability payments. Hence, as Richard and Abbot (2009) conclude, poor childhood and adolescent mental health can have serious and permanent impacts not only on the personal, social and economic relationships of the diagnosed individual, but on society as well.

To date, the existing literature suggests that mental illness often adversely impacts labor market behaviors including education, employment and earnings. With regards to education, studies demonstrate that early onset of mental health disorders has an adverse impact on educational attainment (Eisenberg, Golberstein and Hunt, 2009; Johnston et al. 2011; Currie and Stabile, 2006; Fletcher and Wolfe, 2008; Fletcher, 2008; Fergusson and Woodward, 2002; Breslau et al. 2008; Kessler et al. 1995). The existing literature also suggests that there is an inverse relationship between mental health disorders and the labor force participation rate (Hamilton, Merrigan and Dufresne, 1997; Boardman et al. 2003; Ojeda et al. 2009; Nelson and Kim, 2011; Broadhead et al. 1990; Druss, Schlesinger and Allen, 2001; Stewart et al. 2003; Chatterji, Alegria and Takeuchi, 2011; Rutman, 1994; Baron and Salzer, 2000; French and Zarkin, 1998; Dykacz and Hennessey, 1989; Baron and Salzer, 2002; Baron and Salzer, 2002; Frijters, Johnston and Shields, 2010; Trupin et al. 1997). Finally, the research finds evidence to show that there is a negative association between mental health disorders and earnings (Fitch et al. 2011; Marcotte and Wilcox-Gox, 2003; Levinson et al. 2010; Wildman, 2003; Esan, Kola and Gureje, 2012; Schofield et al. 2013; French and Zarkin, 1998; Bartel and Taubman, 1986).

Though there is a large body of empirical research that analyzes the relationship between mental illness and labor market outcomes, to the best of my knowledge there are few studies that observe how mental illness affects the amount of time an individual spends at work (Chatterji, Alegria and Takeuchi, 2011). Additionally, I find no literature that has observed how the duration of a mental illness affects labor market behaviors. For these reasons, I choose to observe the effects of mental illness on the likelihood of working full time and on the number of hours worked per week. I also add to the existing literature by examining the consequences of each additional year spent living with a mental illness on labor market decisions.

The purpose of this paper is to contribute to mental illness research by analyzing how mental illness impacts different aspects of labor market behavior. I observe the effects of mental illness on the probability of participating in the labor force, the likelihood of working full time, the average number of hours worked per week and annual earnings. I also seek to improve the existing literature by examining the specific impacts of emotional (depression, anxiety, or other emotional problems) and psychological problems (ADD, bipolar disorder, schizophrenia, or other mental problems) on labor market decisions.

These additions to the literature are important because the results may have implications for future research, program restructuring and policy reform. More specifically, future research should be done to make causal inferences regarding the effects realized by individuals with mental illness on labor market outcomes. Additionally, programs, like rehabilitation and employer programs, should undergo restructuration, and federal policy should allocate more funding to specialized treatment.

Using data from the Person-Level files of the 2007 to 2011 National Health Interview Survey (NHIS), I estimate the impact of mental health disorders on labor market outcomes. The results show that there is a negative and statistically significant relationship between having a mental illness and labor market outcomes (the probability of participating in the labor force, the likelihood of working full time, the average number of hours worked per week and annual earnings). Furthermore, the results imply that conditional on having a mental illness, duration is only statistically significant when analyzing hours worked per week and annual earnings; however, unconditional on having a mental illness, duration is statistically significant when analyzing all four aspects of labor market outcomes.

The remainder of the paper is organized as follows: in the second section I review the relevant existing literature. In the third section I discuss the data employed and summary statistics. I explain my empirical strategy and present my results in the fourth section. The conclusion, including policy implications, is discussed in the final section of the paper.

II. Literature Review

The value and analysis of labor market outcomes is significant to society. To date, there is a large body of empirical research that analyzes the relationship between mental illness and labor market behaviors. My study combines the existing literature with new measures of mental health and labor market variables. I will review the current literature that examines the adverse effect between mental illness and education, employment and earnings. Though much of the literature examines mental illness in broad classes, I focus

on the impact of specific conditions as well. These three elements of the literature are related by their relevance to my study, as I analyze labor market outcomes.

II.1 Education

Mental illness often adversely affects human capital accumulation, impacting all stages of labor market engagement. Eisenberg, Golberstein and Hunt (2009) attribute this negative impact on reductions in educational attainment, which may in turn have lasting consequences on labor market behaviors including employment and earnings. A number of recent psychological and economic literatures have shown that for most people with a mental illness, educational attainment is negatively affected.

Recent literature by Johnston et al. (2011) find strong associations that a one standard deviation reduction in the mental health of a child leads to a two to five month loss of educational progress. With regards to educational attainment and specific mental disorders, further research finds that persons diagnosed as schizophrenic have, on average, lower graduation rates from high school (57 versus 66 percent) and college (five versus 17 percent) than their non-schizophrenic counterparts.[4] Additionally, studies by Currie and Stabile (2006) and Fletcher and Wolfe (2008) suggest that ADHD, one of the most prominent mental health problems among children, is strongly associated with negative educational attainment. This has implications for the large presence of mental illness among the adult population. Finally, Fletcher (2008) finds a negative relationship between depression and educational attainment; however the author suggests that this

[4] United States Department of Health and Human Services and National Institute of Mental Health, 1992, "Epidemiologic Catchment Area Study, 1980-1985," *Michigan Inter-University Consortium for Political and Social Research.*

association is difficult to capture because many variables representing the choices that adolescents make before dropping out (e.g. skipping school) cannot be controlled for. Thus, Fergusson and Woodward (2002) indicate that the negative relationship between depression and educational attainment can be attributed to a range of social, familial and personal factors that go beyond the scope of mental illness. The results from these various studies demonstrate that persons diagnosed with a mental health disorder are subject to educational underachievement, which I argue may place them at a disadvantage in the labor market.

II.2 Employment

For a number of years, economists and psychologists have attempted to understand the magnitude of the effects of mental illness on labor market outcomes. Research by Hamilton, Merrigan and Dufresne (1997) and Boardman at al. (2003) finds evidence to show that employment appears to improve mental health, and often, for people living with a mental illness, working can be a fundamental factor that helps maintain mental health, promote recovery and enable social inclusion. Unfortunately however, unemployment rates still range from 60 to 80 percent for people living with a mental illness and as high as 90 percent for people living with a serious mental illness.[5] These unemployment rates are astronomically high, especially in comparison with the current national average unemployment rate of 7.6 percent.[6]

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[5] "The High Costs of Cutting Mental Health," National Alliance on Mental Illness, Last Modified January 2010, http://www.nami.org/Template.cfm?Section=About_the_Issue&Template=/ContentManagement/ContentDisplay.cfm&ContentID=114540.

[6] "Employment Situation Summary," Bureau of Labor Statistics, Last Modified April 5, 2013, http://www.bls.gov/news.release/empsit.nr0.htm.

Several more recent studies have set out to examine the adverse effects of mental illness on employment. Ojeda et al. (2009) conclude that mania and/or delusions are associated with lower rates of work among US-born males and females. Furthermore, Nelson and Kim (2011) suggest that individuals with a mental illness have an increased likelihood of voluntary and involuntary employment termination. They argue that there is a cyclical relationship between mental health and employment: mental illness is associated with a higher risk of employment termination, which has then been shown to contribute to poor physical and mental health as well as to reductions in earnings and future employment opportunities.

Using a different approach to lower labor market outcomes, Broadhead et al (1990), Druss, Schlesinger and Allen (2001) and Stewart et al. (2003) observe that employed individuals with a mental illness are more unproductive at work. Broadhead et al. provide evidence to show that individuals experiencing severe depression are five times as likely as their healthy counterparts to report that they are constrained in their day-to-day activities. Additionally, Druss, Schlesinger and Allen indicate that for employees with depression, the likelihood of decreased effectiveness in the workplace is seven times higher compared to those without such symptoms. Finally, evidence by Stewart et al. (2003) support the findings of Druss, Schlesinger and Allen by concluding that workers with depression report 5.6 hours per week of lost productivity at work, caused more by reduced performance rather than absence, compared to 1.5 hours per week for their non-depressed counterparts.

Though these studies observe how mental illness affects the number of hours of productivity lost in the workplace, to the best of my knowledge, there are few studies that

observe how mental illness affects the amount of time an individual spends at work. One study by Chatterji, Alegria and Takeuchi (2011) estimates the effect on hours worked per year, but finds an insignificant relationship. I presume that mental illness will negatively affect the number of hours an individual chooses to work. Additionally, the studies mentioned focus primarily on the effects of depression. I intend to estimate the effects of emotional problems like depression as well as psychological problems like schizophrenia and bipolar disorder.

While much research has been done to understand the specific impact of mental illness on labor market decisions, a number of other studies have attempted to capture the reasons for the negative relationship between mental disorders and labor force participation rates. Rutman (1994) suggests that the biggest barrier to employment is the symptoms themselves as they often make many basic tasks extremely complicated; however Baron and Salzer (2000) argue that since effective remedial methods have continued to progress and treat symptoms, the biggest barrier has become the lack of effective rehabilitation programs for those intending to find employment. The results from this study suggest that those being served in psychosocial rehabilitation programs have a more positive and successful employment history than previously understood, and thus, the authors suggest that there should be more efforts to design programs and jobs intended to allow individuals to work at least as well as they once did, relatively unburdened by their mental illness.

Additionally, research by French and Zarkin (1998) criticizes employer-based policies and programs that are designed to dissuade the use of alcohol and illicit drugs by workers. They conclude that workers who report symptoms of either emotional or

psychological problems have higher absenteeism from work, and thus, programs and policies should take these other employee behaviors and problems into account as well. Finally, Dykacz and Hennessey (1989) blame the low labor force participation rate on federal disability policies that rob patients of the motivation to work. The authors argue that nearly 43 percent of Disability Insurance beneficiaries who recover will eventually become reentitled to disabled worker benefits.

II.3 Earnings

Given evidence of lower educational attainment and higher unemployment rates among individuals diagnosed with a mental illness, it comes as no surprise that the population affected by mental illness is also at a disadvantage with respect to earnings. Fitch et al. (2011) find evidence that an increase in debt levels is associated with poorer mental health status, however the authors suggest that indebtedness may cause decreased mental health, indicating that there may be a cyclical connection between earnings and debt. Additionally, Marcotte and Wilcox-Gox (2003) conclude that mental illness is associated with large losses in earnings among workers, especially women in lower income brackets. The authors explain this discrepancy in two ways. The first is that labor market conditions affect earnings – mental illness among workers with fewer economic means (lower-paying jobs are less likely to give access to health care, have flexible hours and allow for sick/disability leave) imposes larger losses in earnings. A second explanation posits that workers who exemplify especially debilitating symptoms are more likely to fall to the bottom of the distribution for reasons related to their illness – perhaps taking a poorly paid position in order to accommodate their disability.

This negative relationship between mental illness and earnings is not unique to the United States, but instead remains an issue at the international level. A study by Levinson et al. (2010) surveys 19 countries – 10 high-income and 9 low- and middle-income countries – and finds evidence to show that individuals with serious mental illness earn, on average, one third less than median earnings, with statistically insignificant effects between countries. Additionally, the literature provides evidence to show that mental illness has a statistically significant effect on earnings in Great Britain, Nigeria and Australia according to the conclusions of Wildman (2003), Esan, Kola and Gureje (2012) and Schofield et al. (2012), respectively.

To date, there have been numerous economic and psychology studies conducted to investigate the economic effects of mental illness, however I observe that few studies have measured how mental illness affects the amount of time spent at work. Therefore, I choose to observe the effects of mental illness on the likelihood of working full time and on the number of hours worked per week, as well as on the probability of participating in the labor force and annual earnings. I also aim to distinguish between the consequences of emotional (depression, anxiety, or other emotional problems) and psychological (ADD, bipolar disorder, schizophrenia, or other mental problems) problems on labor market decisions.

The literature I have reviewed focuses on the effects of either having or not having a mental illness and fails to take into account how the duration of living with a mental illness affects labor market behaviors. I think it is valuable to analyze how each additional year spent living with a mental illness impacts labor market decisions. More specifically, I would like to test if each additional year makes the individual more or less

prepared to take on the demands of employment. Thus, I intend to add to the existing literature by examining the consequences of mental illness duration on labor market decisions.

III. Data

I use data from the Person-Level files of the 2007 to 2011 National Health Interview Survey (NHIS) to measure the impact of mental health disorders on labor market behaviors. This annual, cross-sectional data is ideal for the purpose of this study because it provides detailed information on demographic characteristics (age, education, race, gender, marital status and U.S. Citizenship status), labor market behaviors (the probability of participating in the labor force, the likelihood of working full time, the number of hours worked per week and annual personal earnings), as well as the necessary information on mental health status (whether the respondent is limited by an emotional or psychological problem, and if so, the duration of the respondent's diagnosis of said mental health problem).

The NHIS is a health survey conducted by the National Center for Health Statistics (NCHS) and designed by the Centers for Disease Control and Prevention (CDC). It is the principal source of information on the health of the civilian non-institutionalized and nonmilitary household population of the United States.[7] The NHIS is a complex data source for analyzing the relationships between labor market behaviors and mental health.

[7] "2011 National Health Interview Survey (NHIS): Public Use Data Release," National Health Interview Survey, Last Modified June 2012.

I choose to use several years of the NHIS data to increase the number of observations on mental health and the precision of my estimates. The Person-Level files gather information from any adult household member who is present at the time of the interview. [8] The questions are designed to gather specific information about the respondent. The topics that are covered in the Person-Level file include health status and limitations of activities, duration of health problems, access to health care and utilization, health insurance, socio-demographic factors, earnings and assets, education and labor market activity.

I restrict my analysis to men and women between the ages of 25 and 64. I impose this age restriction for two reasons. First, as Kessler et al. (2005a) conclude, mental disorders often strike individuals during adolescence and young adulthood. More specifically, this research indicates that 50 percent of all lifetime mental health disorders begins at age 14 and 75 percent begins at age 24. Second, this age group focuses on individuals who have most likely completed their formal education and have not formally retired.

I further restrict the sample by excluding any missing values for my variables of interest, resulting in 54,425 lost observations (274 lost observations from the mental health variables, 2,074 from the probability of working variable, 2,212 from the number of weekly hours worked variable, 158 from the number of months worked variable, 37 from the job status variable, 39,419 from the earnings variable, 5,233 from the education

[8] The Person-Level file is derived from the Family Core file of the NHIS. The Family Core questionnaire is given to one household member who is at least the age of legal majority (over the age of 18). This member responds for all other members of the family. However, any adult household members who are present at the time of the interview may participate and respond for themselves.

variable, 762 from the U.S. Citizenship status variable and 821 from the marital status variable). I also choose to restrict my marital status variable by excluding widowers and thus, I lose an additional 3,435 observations. These restrictions result in a final sample size of 3,803 respondents experiencing only symptoms of emotional problems and not psychological problems, 371 respondents experiencing only symptoms of psychological problems and not emotional problems and 165,834 respondents experiencing symptoms of neither mental illness.

III.1 Mental Health Variables

I choose to observe the effects of two different categories of mental illness: emotional problems including depression and anxiety and psychological problems including ADD, bipolar disorder and schizophrenia, henceforth referred to as "emotional problems"[9] and "psychological problems,"[10] respectively. I focus on these measures of mental health status so I can examine the effects of a wide range of mental illnesses on labor market behaviors.

I create two indicator variables for mental health status equal to one if the respondent is limited by the mental illness in question, and zero otherwise. I also manipulate the variables that represent the length of time that the respondent has lived with the disorder in question.[11] I create four duration variables, two of which are

[9] The variable that represents limitations by depression, anxiety, or emotional problems is LAHCA17 in the NHIS.

[10] The variable that represents limitations by depression, anxiety, or emotional problems is LAHCA30_ in the NHIS.

[11] The variable that represents the length of time (in years) that the respondent has suffered from emotional problems is represented by LADURA17, and the variable that represents the length of time (in years) that the respondent has suffered from psychological problems is represented by LADURA30 in the NHIS.

conditional on having a mental illness and two of which are unconditional. For the conditional duration variables I only analyze respondents who have indicated that they have lived with said mental health problem for at least one year, whereas for the unconditional duration variables I include respondents who have indicated that they are not affected by a mental illness. These respondents are considered as having lived with a mental illness for zero years.

Table 1 presents overall summary statistics. The results suggest that a total of two percent of the sample is affected by an emotional problem and 0.30 percent is affected by a psychological problem. The summary statistics also imply that for those respondents who have indicated that they have a mental illness, the average duration of emotional problems is 16.59 years and the average duration of psychological problems is 20.69 years. However, for the larger sample of respondents, which includes respondents who do not have a mental illness, the average duration of emotional problems is 0.37 years and the average duration of psychological problems is 0.06 years.

These results suggest that the number of people affected by either mental health problem is very small relative to the number of total observations in my data set. This may be because the respondent has chosen not to disclose the information, is unaware of his or her diagnosis, or simply is not affected by said disorder. This limitation implies that the findings may not be able to be generalized to the rest of the community that experiences symptoms of mental illness.

III.2 Dependent Variables

I consider four measures of labor market behaviors as my dependent variables. The first is an indicator variable that measures the probability of participating in the labor

force. It equals one if the respondent worked for pay in the previous calendar year, and zero otherwise. The second is an indicator variable that measures the likelihood of working full time. It is set to equal one if the respondent works 40 hours or more per week, and zero if the respondent either does not participate in the labor force or works 39 hours or less per week. I also consider the number of hours worked in the last calendar week. I consider respondents who indicate that they did not work in the last calendar year as working zero hours. Finally, I observe annual personal earnings.

I make several corrections to the earnings variable, which measures total personal earnings in the last calendar year. The earnings variable is categorized into intervals, so I convert the categorical variable into a linear earnings variable by taking the midpoint of each interval. The next adjustment I make is to correct for top coded earnings.[12] Top coding problems arise in most data sets in order to censor for privacy and thus, higher end earnings are increasingly underestimated. To correct for this problem, I multiply the highest given wage, $75,000, by a factor of 1.4 (Lemieux, 2006). Further, I use the consumer price index (CPI) to adjust for inflation in my summary statistics. Because the reported earnings are from the previous calendar year (respondents surveyed in 2007 report their annual earnings from 2006), I adjust the earnings levels to equal that of 2010

[12] The total personal earnings variable, ERNYR_P, has been top-coded to the 95th percentile of the appropriate distribution. NHIS top-codes in order to balance respondent confidentiality against providing more detailed information. There are five supplemental datasets that contain imputed earnings files for each year. The 95th percentile was calculated separately for the five imputed personal earnings datasets and then a weighted average of the five individual 95th percentile amounts were calculated. The weighted average was rounded to the nearest $1,000 and this weighted average was used to top-code all five supplemental imputed personal earnings datasets.

in order to standardize the buying power of each dollar earned to the most recent year of data considered in my analysis.[13]

For summary statistics purposes, I also choose to analyze two additional labor market supply variables in order to get a better understanding of how mental illness affects other aspects of the labor market. I observe the number of months the respondent worked in the last calendar year. I consider respondents who indicated that they did not work in the last calendar year as working zero months. I also observe the respondent's job status in the last calendar week. I create an indicator variable for labor force participation equal to one if the respondent was working for pay at a job or business, with a job but not at work, looking for work, or working but not for pay, and equal to zero if the respondent was neither working nor looking for work.

Table 1 demonstrates that 74 percent of the sample participates in the labor force and 53 percent usually works full time. The average annual earnings is $41,791.57, the average number of hours worked per week is 28.60 and the average number of months worked per year is 8.23. The results also indicate that 76 percent of the sample has a job or is looking for one.

III.3 Explanatory Variables

The analysis also includes a number of demographic characteristics. Specifically, I create age indicator variables to be able to measure the impacts that mental health disorders have on labor market behaviors by age group. The age categories are measured as follows: 25-34, 35-44, 45-54 and 55-64. I also create education indicator variables. I

[13] I use the U.S. Bureau of Labor Statistics CPI Inflation Calculator to convert the earnings levels into 2010 dollars. The CPI for 2006 is 1.08, for 2007 is 1.05, for 2008 is 1.01, for 2009 is 1.02 and for 2010 is 1.00.

examine four educational attainment categories: those who did not graduate from high school, those who received only a high school diploma or GED, those who attended only some college and those who attained an Associate's Degree, Bachelor's Degree, Master's Degree or above. Further, I create five racial/ethnic group indicator variables: non-Hispanic White, Hispanic, non-Hispanic Black, non-Hispanic Asian and non-Hispanic Other, henceforth referred to as White, Hispanic, Black, Asian and Other. Finally, I create an indicator variable for gender equal to one if female and zero if male. I do this in order to capture the differences of the impact of mental health on labor market decisions by gender.

I also create an indicator variable for marital status that is set to equal one if the respondent is married, and zero if the respondent is divorced, separated, never married or living with a partner. Though "separated" couples are still considered married, I add them to the unmarried category because research by Bartel and Taubman (1986) suggests that mental illness is more highly correlated with divorce and separation. Finally, I create an indicator variable for U.S. Citizenship status equal to one if the respondent is a U.S. citizen, and zero otherwise.

Table 1 also presents summary statistics on the independent variables. The results show that there is a relatively even age and gender distribution. With regards to education, 16 percent of respondents did not graduate from high school, 26 percent indicated that they received only a high school diploma or GED, 18 percent attended some college and 40 percent attained an Associate's Degree or higher. Furthermore, 56 percent of the respondents is White, 22 percent is Hispanic and 14 percent is Black.

Finally, the results imply that 64 percent of the sample is married and 86 percent is U.S. citizens.

I choose to control for these confounding variables because the existing literature provides evidence of discrimination against certain demographic groups. Research by Posner (1999) shows evidence of discrimination in the workplace against the elderly for reasons motivated by ignorance or resentment towards older people, or for pure favoritism of younger people. Though I restrict the age group of my sample, Posner suggests that people over the age of 40 are subject to a type of discrimination known as "ageism," which is analogous to sexism and racism. Queneau and Sen (2012) also conclude that employment discrimination against blacks and, to a lesser extent, against Hispanics is a prominent issue. Finally, England, Gornick and Shafer (2012) conclude that there is prejudice against females in the workplace; though in more recent decades women with less education are discriminated against more often than women with more education.[14]

I also control for marital status because the existing literature has demonstrated that marital status affects men and women differently with regards to employment. Jordan and Zitek (2012) show evidence that employers perceive married female job applicants as less suitable for employment than their single counterparts, while married male applicants are viewed as more favorable than their single counterparts. Additionally, the job performance and dedication of a recently married woman is predicted to decline, while the dedication of a recently married man is expected to rise. These results suggest

[14] This may imply that there is more evidence of discrimination towards an uneducated group of people, than towards women.

that employer biases may make employers more willing to hire men over women, and lay off women over men.

Finally, I decide to control for U.S. Citizenship status because most federal jobs in the United States require applicants to be a U.S. citizen, and thus, non-U.S. citizens have fewer employment opportunities than their citizen counterparts.

III.4 Health Condition Variables

I choose to control for a number of health variables as well because Kessler et al. (2005a) suggest that delays in seeking treatment can lead to more severe and difficult to treat illnesses, and to the development of co-occurring mental illnesses. Similarly, Kandel et al. (1999) conclude that individuals with early-onset mental disorders often show patterns of comorbidity. Thus, controlling for these other health conditions may prove to be important in order to isolate the effects of the mental health conditions.

I create indicator variables for vision problems, hearing impairments, substance abuse and mental retardation, which includes other development problems. I create an indicator variable for physical disabilities as well, which equals one if the respondent has back or neck injuries, fractures, bone or joint injuries, missing or amputated limbs or other physical disabilities, and zero otherwise. I also create an indicator for chronic diseases equal to one if the respondent suffers from arthritis or rheumatism, heart problems, stroke, hypertension, diabetes, lung or breathing problems, cancer or weight problems, and zero otherwise. Finally, I create an indicator variable for other defects or conditions that may impose hardship on an individual in the workplace. It is set to equal one if the respondent has other conditions including birth defects, senility, musculoskeletal or connective tissue problems, circulation problems, endocrine or

metabolic problems, nervous system or sensory organ problems, digestive system problems, genitourinary system problems, skin or subcutaneous system problems, blood or blood forming organ problems, benign tumors or cysts, surgical after-effects or medical treatment issues, old-age, fatigue, weakness or pregnancy limitations, and zero otherwise.

Table 1 shows that 0.8 percent of the sample has vision problems, 0.4 percent has hearing problem, 0.02 percent struggles with substance abuse problems, 0.5 percent is mentally challenged, five percent has physical disabilities, six percent has a chronic disease and four percent deals with another health condition.

These results suggest that the self reported health conditions seem to be much lower than the national average. For example, the CDC estimates that approximately 9.2, 16 and 16.2 percent of the U.S. adult population has vision trouble, hearing trouble and physical functioning difficulty, respectively.[15] It is most interesting to note the very low number of substance abusers. The Substance Abuse and Mental Health Services Administration (2011) provides evidence to show that approximately 9.1 percent of the United States population is substance abusers.[16] This number is not consistent with the results of this sample. This limitation is discussed in more detail in the following section.

III.5 Summary Statistics by Mental Health Status

Table 2 presents summary statistics by mental health status. I isolate the effects of mental illness by gathering summary statistics for respondents affected only by emotional

[15] "Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2011," Centers for Disease Control and Prevention, Last Modified December 2012.

[16] "National Survey Shows a Rise in Illicit Drug Use from 2008 to 2010," Last Modified September 8, 2011, http://www.samhsa.gov/newsroom/advisories/1109075503.aspx.

problems and not psychological problems, and similarly for respondents affected only by psychological problems and not emotional problems. The results imply that respondents affected by either mental health condition are less attached to the labor market than their "healthy" counterparts.

More specifically, individuals with an emotional or psychological problem are less likely to work for pay and work full time compared to those who do not have a mental illness. On average, 24 (23) percent of respondents with an emotional (psychological) problem compared to 76 percent of respondents without a mental disorder indicates that they work for pay; and eight (ten) percent of respondents with an emotional (psychological) problem compared to 54 percent of respondents with no mental illness works full time. These results are consistent with the findings of Baron and Salzer (2002), which report that relative to the general population, individuals diagnosed with a serious mental illness are faced with notably high rates of unemployment.

It can further be inferred that labor market success, measured in annual personal earnings, is lower for those respondents living with a mental disorder. The average annual earnings for those affected by an emotional (psychological) problem are $20,727.52 ($23,083.95) compared to $41,965.02 for those affected by neither. This is consistent with the findings of French and Zarkin (1998), which provide evidence to show that there is a statistically significant negative relationship between symptoms of emotional and psychological problems and personal earnings. The authors argue that workers who experience these symptoms are at a disadvantage in terms of earnings in comparison to their "healthy" coworkers.

Furthermore, the results demonstrate that having symptoms of a mental illness result in respondents working fewer hours per week and fewer months per year. Those who are affected by an emotional (psychological) problem work 5.75 (6.42) hours and 2.07 (2.10) months, while those who are unaffected work 29.19 hours and 8.39 months. Finally, the results conclude that 22 (26) percent of respondents with an emotional (psychological) problem compared to 77 percent of respondents with neither mental disorder indicates that they have a job or are actively looking for one.

Regarding educational attainment, the results suggest that on average, 26 percent of respondents who suffer from either an emotional or psychological problem does not graduate from high school compared to 16 percent who is unaffected by a mental illness. Additionally, 21 percent of respondents who suffers from either an emotional or psychological problem drop out of college compared to 18 percent who is unaffected by an illness. Though the results for education remain relatively stable for all groups, I observe that those affected by either mental health status are more likely to drop out of high school before receiving a diploma or GED and are more likely to drop out of college before attaining a degree. These results are consistent with the existing literature. Breslau et al. (2008) show that there is significant evidence to support the notion that mental disorders lead to termination of schooling prior to the completion of the four educational milestones (primary school graduation, high school graduation, college entry and college graduation). Furthermore, Kessler et al. (1995) test respondents who have no history of any diagnosed disorder against those who have one or more such disorders. The authors conclude that the probabilities of dropping out of school are consistently higher among

respondents with a prior disorder, and they estimate that more than 7.2 million people prematurely end their education due to early-onset mental health disorders.

With respect to demographic characteristics, approximately 61 (64) percent of respondents with an emotional (psychological) problem is White. I argue that these results are more indicative of the larger sample and do not necessarily capture the effects of mental illness on race and ethnicity. Further, 20 percent of Black respondents indicates that they have a psychological problem and 19 percent states that they have an emotional problem. This result is consistent with the findings of Marano (2003), which explain that black individuals are more likely to be diagnosed with schizophrenia than with depression.

In addition, 38 percent of males and 62 percent of females suffer from emotional problems; and 54 percent of males and 46 percent of females suffer from psychological problems. These results suggest that women are more likely to suffer from depression, anxiety or emotional problems, which is consistent with the findings of Nelson and Kim (2011), which indicate that mental illness such as depression, anxiety and PTSD are more likely to strike women. These patterns also suggest that males may be more susceptible to psychological problems such as ADD, bipolar disorder and schizophrenia. Existing research by the CDC (2011) provides some evidence to support these patterns. Though the research suggests that bipolar disorder is more common among women than men, with an approximate ratio of three to two, the evidence also shows that major depression is reported more frequently by women than men, and for schizophrenia, the findings

suggest that by the age of 30, nine out of ten men, compared to two out of ten women, will have the illness.[17]

Further, suffering from a mental illness largely decreases the likelihood that the respondent will marry. On average, 36 (25) percent of respondents with an emotional (psychological) problem compared to 65 percent of respondents without either mental illness indicates that they are married. This is consistent with the findings of Bartel and Taubman (1986), which imply that mental illness significantly increases the probability of remaining single, and, for those individuals that do end up marrying, there is an increased likelihood of divorce or separation.

Finally, with respect to health conditions, the results suggest that individuals with an emotional problem are more likely to also be affected by another health condition, particularly, physical disabilities, chronic diseases, or other health conditions. These results are consistent with the findings of Chapman, Perry and Strine (2005), which indicate that mental illnesses, particularly depressive disorders, are associated with many chronic diseases including asthma, arthritis, cardiovascular disease, cancer, diabetes and obesity. Further, Bener et al. (2006) and Jonas and Mussolino (2000) report that there is a positive relationship between mental illness and hypertension or stroke, respectively. The results also show that substance abuse is higher among respondents with a mental illness. This is consistent with the findings of Epstein et al. (1998) and Hall, Howard and McCabe (2010), which have provided evidence to show that in the presence of mental illness symptoms, some individuals turn to the use of alcohol and/or illicit drugs for

[17] "Burden of Mental Illness," Centers for Disease Control and Prevention, Last Modified July 1, 2011, http://www.cdc.gov/mentalhealth/basics/burden.htm.

purposes of self-treatment. The remainder of this paper formally analyzes these key differences.

IV. Empirical Strategy and Results

IV.1 Empirical Model

As noted, the goal of this paper is to estimate the consequences of mental illness on labor market behaviors. To do this, I formally analyze the influence of mental health on labor market outcomes by applying ordinary least squares (OLS). I use a linear probability model (when the dependent variable is an indicator variable) and a linear regression model of the following form:

$$Y_{it} = \alpha + \gamma MH_{it} + \theta H_{it} + \sigma LS_{it} + \beta X_{it} + \delta YR_{it} + \varepsilon_{it}. \quad (1)$$

I run standard regressions for all variables, however I also choose to use dprobit to interpret the estimated marginal effect at the mean for the indicator dependent variables.[18]

The vector *Y* represents varying measures of labor market outcomes. I estimate two labor market indicator variables: one that measures the probability of participating in the labor force, and one that measures the likelihood of working full time. I also analyze the effects on the average number of hours worked per week and on annual personal earnings.

MH is a measure for mental health (whether or not the respondent has an emotional or psychological problem, and the duration of said mental health problem). The vector *H* represents a set of health condition control variables (vision problems, hearing problems, substance abuse, mental retardation, physical disabilities, chronic

[18] I do not formally discuss the results of the dprobit model, however they are available upon request.

diseases and other health conditions). The vector *LS* represents a set of labor supply characteristics (hours worked per week and months worked per year), which are used as control variables for the analysis of annual earnings. The vector *X* is a set of variables that reflect observable characteristics (age, education, race, gender, marital status and U.S. Citizenship status). Finally, the vector *YR* is a set of mutually exclusive binary variables representing the survey year. This vector is designed to capture the differences in labor market outcomes over time. The term ε is a random error term with the usual properties.

IV.2 Results

I estimate six specifications using Equation (1). In my first specification, I regress only the indicator variable that measures emotional problems. In my second specification, I regress emotional problems and include other health controls. In my third specification, I regress only the indicator variable that measures psychological problems. In my next specification, I regress psychological problems and include other health controls. In my fifth specification, I regress both indicator variables for emotional and psychological problems. Finally, in my sixth specification, I regress both emotional and psychological problems and include other health controls.

The results of all six estimations are presented in Tables 3 through 6. I will formally discuss only the estimation results for Specification 6, which analyzes the effects of both measures of mental illness while controlling for other health conditions. As Tables 3 through 6 report, the relationships between mental illness and labor market outcomes are negative and statistically significant at the one percent level ($p<0.01$). According to Table 3, an individual with emotional or psychological problems is 23.9 or

42.1 percentage points less likely to participate in the labor force, respectively. A similar relationship is found between mental illness and the likelihood of working full time. As Table 4 shows, an individual with emotional or psychological problems is 20.3 or 34.8 percentage points less likely to work full time. These results are consistent with existing research. Specifically Frijters, Johnston and Shields (2010) conclude that a one standard deviation decrease in mental health reduces the probability of participation in the work force. Additionally, Trupin et al. (1997) find that the labor force participation rate – the percentage of those who are either working full time or looking for work – of individuals affected by mental illness has stayed stagnant at around 25 percent since the mid-1980's.

Additionally, mental illness plays a large role in determining number of hours worked per week. Table 5 reports that individuals with emotional or psychological problems work, on average, 10.88 or 18.25 fewer hours per week than their "healthy" counterparts, respectively. This result is quite different than that seen in the literature of Chatterji, Alegria and Takeuchi (2011), which suggests that the relationship between psychiatric disorders and the number of hours worked in the past year is statistically insignificant. The authors do however support the results in Tables 3 and 4 by providing evidence to show a negative and statistically significant relationship with labor force participation and employment.

Finally, Table 6 provides evidence to show a negative relationship between mental illness and earnings. The results suggest that individuals with emotional or psychological problems earn, on average, $2,951 or $5,690 less per year, respectively. These results are consistent with a large body of empirical research linking mental illness with lower earnings. Specifically, my findings are supported by the literature I reviewed

above and by the research of Bartel and Taubman (1986), which suggests that psychoses (schizophrenia, affective psychoses and paranoia), neuroses and other personality disorders cause reductions in an individual's earnings.

To the best of my knowledge, no other research has observed how the duration of a mental illness affects labor market behaviors, and thus, I proceed to examine the consequences of each additional year spent living with a mental illness on labor market decisions.

I estimate four additional specifications using Equation (1). In my first specification, I regress the conditional emotional duration variable, which measures the number of years the respondent has lived with an emotional problem, conditional on having a mental illness. In my second specification, I regress the unconditional emotional duration variable, which is unconditional on having a mental illness and includes respondents who do not have an emotional problem. In my third specification, I regress the conditional psychological duration variable, which measures the number of years the respondent has lived with a psychological problem. Finally, in my fourth specification, I regress the unconditional psychological duration variable, which includes respondents who do not have a psychological problem.

As seen in the estimation results presented in Tables 7 through 10, the relationships between labor market outcomes and the unconditional duration variables are negative and statistically significant at the one percent level; however the relationships with the conditional duration variables either lose their significance altogether or the significance drops to the ten percent level ($p<0.1$). The most interesting result appears in Table 9. Specifically, the results show that conditional on having a mental illness, one

extra year of living with a psychological problem increases the number of hours worked per week, while unconditional on having a mental illness, one extra year decreases the number of hours worked per week. I conjecture that the reason for this increase in hours worked relies on the fact that for each additional year, respondents who already have the disorder have learned to better manage and cope with the symptoms of their illness, and thus, working more hours per week may not be as burdensome.

One of the more surprising aspects of my results is the large change in statistical significance between the conditional and unconditional duration variables. I argue that the reason for these changes is in part due to the differences in the number of observations between the conditional and unconditional variables. Furthermore, I speculate that the respondents in the conditional group already realize the effects of having a mental illness, and thus, each additional year does not result in a substantial difference.

The estimation results for the vectors of health conditions, observable characteristics and year dummies are fairly standard and generally have the expected effects. Thus, I choose not to formally discuss these results, however they are reported in Tables 3 through 10. For variable definitions, see Table 11.

While most of these estimations find significant relationships between mental illness and labor market outcomes, it is important to note that very little of the variance in labor market behaviors is explained by these specifications. With R-squared values below 20 percent (with the exception of the annual earnings specifications), it can be concluded that these estimations do not capture the many additional factors that contribute to labor market outcomes.

IV.3 Limitations

Perhaps the most obvious limitation is the small sample size. As mentioned above, I restrict my sample size by excluding any missing values for my variables of interest. I drop any respondent from my data if they refused to answer, if they believed the answer was not yet ascertained, or if they did not know the answer. These restrictions leave me with 3,803 observations of individuals affected only by emotional problems and not psychological problems, approximately two percent of my sample. Further, I am left with 371 observations of individuals affected only by psychological problems and not emotional problems, approximately 0.30 percent of my sample. This limitation implies that there may be an increased margin of error, and thus, the findings may not be able to be generalized to the broader community that experiences symptoms of mental illness. These results may benefit from appending several more years of data to further increase the sample size.

Additionally, I had intended on controlling for health benefits because research by Royalty and Abraham (2006) demonstrates that employer-based health benefits act as incentives for employment, with approximately 64 percent of non-elderly Americans obtaining their access to health insurance through an employer. I was unable to so however, because a large number of observations were missing for this variable. Though this variable is conditional on working, nearly 8,000 respondents who worked chose not to answer, and thus, dropping these missing observations would have further decreased my sample size. I presume that this variable would be positively correlated with the labor market outcomes that I measure.

A final limitation is the self-report nature of the assessment. Though this is a popular means of gathering data, there are a number of reasons why these types of questionnaires may not be valid. First, the respondent may perceive him/herself differently, and thus, may inadvertently provide an inaccurate response to a question. Second, respondents may have difficulty interpreting the questions or the rating scale. Another issue is that of transparency. The results of this study rely heavily on the total honesty of the respondents; however for many reasons, including image management, respondents may be more inclined to answer dishonestly, particularly for more controversial topics like substance abuse. For example, as I discussed above, the percent of substance abusers in my sample is about nine percent lower than the national average. Furthermore, Bound (1991) finds evidence that self-reporters are often biased in their health assessments, overstating the effects of health on labor force participation in order to justify their unemployment. These biases, if present in my sample, may have large affects on the results of my estimations.

V. Conclusion

Mental illness has the potential to have serious and permanent impacts not only on the personal, social and economic relationships of the affected individual, but also on society as a whole. The burden of mental illness costs our nation hundreds of billions of dollars annually in the form of health expenditures, disability payments and lost income. The majority of the existing literature attributes the economic losses to lower unemployment and earnings among the mentally ill population (see for example, Trupin et al. 1997; Rutman, 1994; French and Zarkin, 1998; Bartel and Taubman, 1986; Marcotte and Wilcox-Gox, 2003). Thus, it is important to understand the extent of the

consequences of mental illness on labor market decisions because of the significance they have on society.

The purpose of this paper is to further analyze how mental illness impacts different aspects of labor market behavior. Using data from the 2007 to 2011 National Health Interview Survey, I add to the existing literature by examining the consequences of each additional year spent living with a mental illness on labor market outcomes. I also observe the affects of mental illness on the probability of participating in the labor force, the likelihood of working full time, the average number of hours worked per week and annual earnings. Finally, I aim to improve the existing literature by examining the specific impacts of emotional (depression, anxiety, or other emotional problems) and psychological problems (ADD, bipolar disorder, schizophrenia, or other mental problems) on labor market decisions.

The results of this study demonstrate that there is a negative and statistically significant relationship between having a mental illness and labor market outcomes (the probability of participating in the labor force, the likelihood of working full time, the average number of hours worked per week and annual earnings). Furthermore, an interesting aspect of the results provides evidence to show that there is a large change in statistical significance between the conditional and unconditional duration variables. The results imply that conditional on having a mental illness, duration is only statistically significant when analyzing hours worked per week and annual earnings; however, unconditional on having a mental illness, duration is statistically significant when analyzing all four aspects of labor market outcomes.

These results strongly suggest that being affected by mental illness is associated with lower labor market outcomes. Specifically, psychological problems are more likely to have a larger impact on labor market behaviors than emotional problems. Further research is needed to make causal inferences regarding the more substantial affects realized by individuals with psychological problems on labor market decisions. Future research may also wish to provide explanations for the differences in statistical significance between the conditional and unconditional duration variables. Furthermore, this data set does not take into account respondents who are in remission at the time of the survey. Future studies may benefit from distinguishing between individuals who are and are not in remission with regards to the duration variable.

The results may also have significant labor market consequences for firms and society as a whole since the mentally ill population in the United States is growing at such an increasingly alarming rate. Understanding the underlying reasons for poor labor market behavior is very important for policy reform concerning rehabilitation programs and federal funding.

Specifically, the results may suggest that programs, like rehabilitation programs, be restructured – to put more of an emphasis on preparing the individuals, particularly individuals with psychological problems, to cope with demanding work schedules rather than focusing primarily on assisting them with entering the labor force. Employers may also benefit from reorganizing their own programs. Employed individuals with a mental illness who are in remission may choose not to disclose their disorder to their employer. If the individual encounters an emotional or stressful event, symptoms may be triggered,

which may result in the downward spiral of the individual; therefore, employers should have programs in place to handle these types of situations.

Employers must begin to consider the fact that mental illness affects productivity in the workplace, and thus, they should create an environment in which employees feel safe to disclose their mental health status without fear of negative consequences. Luo et al. (2010) suggest that one way to do this would be to integrate clinical treatments for mental illness into employer-related interventions in order to help individuals who are recovering from a mental illness maintain their jobs. One hesitation may be that these treatment costs may be inefficient, however as Wang, Simon and Kessler (2003) suggest, treatments lead to enhanced work performance and decreased utilization and costs of general health services. The economy may also benefit from national policy aimed at increasing funding for treatments. As Zhang, Rost and Fortney (1999) imply, depression treatments provided by specialists, though more expensive, will prove to have long-term benefits in terms of savings in lost earnings. If extended to a broader array of mental illnesses, specialized treatment may have a positive economic impact at the personal and societal level.

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Table 1.
Mental Health Status Summary Statistics

Variable	Total	Mean	Standard Deviation
Emotional Problems	170121	0.02	0.15
Psychological Problems	170121	0.003	0.05
Duration of Emotional Problems (Unconditional)	170121	0.37	3.16
Duration of Psychological Problems (Unconditional)	170121	0.06	1.33
Duration of Emotional Problems (Conditional)	3802	16.59	13.37
Duration of Psychological Problems (Conditional)	483	20.69	14.14
Work for Pay Last Year	170121	0.74	0.44
Usually Work Full Time	170121	0.53	0.50
Earnings (CPI-Adjusted for 2010)	126513	41791.57	27055.48
Hours Worked Last Week	170121	28.60	21.41
Months Worked Last Year	170121	8.23	5.24
Job Status Last Week	170121	0.76	0.43
Age ^			
25-34	170121	0.27	0.44
35-44	170121	0.26	0.44
45-54	170121	0.26	0.44
55-64	170121	0.20	0.40
Education ^			
Did Not Graduate from High School	170121	0.16	0.37
High School Diploma or GED	170121	0.26	0.44
Some College	170121	0.18	0.38
Associate's Degree or Above	170121	0.40	0.49
Race/Ethnicity ^			
White (Not Hispanic)	170121	0.56	0.50
Hispanic	170121	0.22	0.41
Black (Not Hispanic)	170121	0.14	0.35
Asian (Not Hispanic)	170121	0.07	0.25
Other (Not Hispanic)	170121	0.01	0.09
Gender ^			
Male	170121	0.47	0.50
Female	170121	0.53	0.50
Marital Status	170121	0.64	0.48
U.S. Citizenship Status	170121	0.86	0.34
Health Conditions			
Vision Problem	170121	0.008	0.09
Hearing Problem	170121	0.004	0.06
Substance Abuse	170121	0.0002	0.01
Mental Retardation	170121	0.005	0.07
Physical Disabilities	170121	0.05	0.22
Chronic Disease	170121	0.06	0.23
Other Health Conditions	170121	0.04	0.20

Source: United States National Health Interview Survey.
^ Sums to one and interpreted as a percentage.
- Number of observations differs for earnings and duration because the variables are conditional on working and having a mental illness, respectively.

Table 2.
Summary Statistics by Mental Health Status

Variable	Affected by Depression, Anxiety, or Emotional Problems		Affected by Mental Problem, ADD, Bipolar, or Schizophrenia		Affected by Neither Emotional or Psychological Problems	
	Obs.	Yes	Obs.	Yes	Obs.	Yes
Work for Pay Last Year	3803	0.24	371	0.23	165834	0.76
Usually Work Full Time	3803	0.08	371	0.10	165834	0.54
Earnings (CPI-Adjusted for 2010)	928	20727.52	86	23083.95	125480	41965.02
Hours Worked Last Week	3803	5.75	371	6.42	165834	29.19
Months Worked Last Year	3803	2.07	371	2.10	165834	8.39
Job Status Last Week	3803	0.22	371	0.26	165834	0.77
Age ^						
25-34	3803	0.16	371	0.30	165834	0.27
35-44	3803	0.23	371	0.27	165834	0.27
45-54	3803	0.33	371	0.24	165834	0.26
55-64	3803	0.29	371	0.18	165834	0.20
Education ^						
Did Not Graduate from High School	3803	0.26	371	0.26	165834	0.16
High School Diploma or GED	3803	0.31	371	0.33	165834	0.26
Some College	3803	0.21	371	0.21	165834	0.18
Associate's Degree or Above	3803	0.21	371	0.20	165834	0.40
Race/Ethnicity ^						
White (Not Hispanic)	3803	0.61	371	0.64	165834	0.56
Hispanic	3803	0.16	371	0.13	165834	0.22
Black (Not Hispanic)	3803	0.19	371	0.20	165834	0.14
Asian (Not Hispanic)	3803	0.02	371	0.02	165834	0.07
Other (Not Hispanic)	3803	0.02	371	0.01	165834	0.01
Gender ^						
Male	3803	0.38	371	0.54	165834	0.47
Female	3803	0.62	371	0.46	165834	0.53
Marital Status	3803	0.36	371	0.25	165834	0.65
U.S. Citizenship Status	3803	0.97	371	0.98	165834	0.86
Health Conditions						
Vision Problem	3803	0.10	371	0.01	165834	0.01
Hearing Problem	3803	0.05	371	0	165834	0.002
Substance Abuse	3803	0.002	371	0.003	165834	0.0001
Mental Retardation	3803	0.02	371	0.02	165834	0.005
Physical Disabilities	3803	0.33	371	0.06	165834	0.04
Chronic Diseases	3803	0.43	371	0.11	165834	0.05
Other Health Conditions	3803	0.30	371	0.10	165834	0.04

Source: United States National Health Interview Survey.
^ Sums to one and interpreted as a percentage.
- Number of observations differs for earnings and duration because the variables are conditional on working and having a mental illness, respectively.

Table 3.
Estimation Results – How Mental Health Status Affects the Probability of Participating in the Labor Force

VARIABLES	(1) Work for Pay	(2) Work for Pay	(3) Work for Pay	(4) Work for Pay	(5) Work for Pay	(6) Work for Pay
EMOTIONAL	-0.456***	-0.250***	-	-	-0.446***	-0.239***
	(0.007)	(0.007)			(0.007)	(0.007)
PSYCHOLOGICAL	-	-	-0.507***	-0.464***	-0.420***	-0.421***
			(0.019)	(0.018)	(0.019)	(0.018)
VISION	-	-0.067***	-	-0.099***	-	-0.069***
		(0.011)		(0.011)		(0.011)
HEARING	-	0.006	-	-0.033**	-	0.002
		(0.016)		(0.016)		(0.016)
SUBABUSE	-	-0.285***	-	-0.317***	-	-0.276***
		(0.071)		(0.071)		(0.071)
MENTALRE	-	-0.412***	-	-0.417***	-	-0.410***
		(0.013)		(0.013)		(0.013)
PHYSICAL	-	-0.217***	-	-0.235***	-	-0.219***
		(0.005)		(0.005)		(0.005)
CHRONIC	-	-0.254***	-	-0.277***	-	-0.253***
		(0.005)		(0.005)		(0.005)
OTHERCON	-	-0.215***	-	-0.230***	-	-0.214***
		(0.005)		(0.005)		(0.005)
AGE35_44	0.006**	0.016***	0.002	0.015***	0.006**	0.016***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
AGE45_54	-0.015***	0.013***	-0.022***	0.012***	-0.015***	0.013***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.003)
AGE55_64	-0.179***	-0.122***	-0.188***	-0.121***	-0.179***	-0.123***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
NOHSGRAD	-0.112***	-0.090***	-0.120***	-0.091***	-0.111***	-0.089***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
SOMECOL	0.065***	0.057***	0.065***	0.057***	0.064***	0.057***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
DEG	0.128***	0.108***	0.134***	0.108***	0.128***	0.107***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
HISPANIC	0.015***	0.003	0.018***	0.003	0.014***	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
BLACK	-0.031***	-0.024***	-0.029***	-0.022***	-0.031***	-0.024***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
ASIAN	-0.062***	-0.070***	-0.060***	-0.070***	-0.063***	-0.070***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
OTHER	-0.074***	-0.054***	-0.087***	-0.058***	-0.075***	-0.055***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
FEM	-0.150***	-0.149***	-0.155***	-0.151***	-0.151***	-0.149***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
MARITAL	-0.003	-0.024***	0.007***	-0.021***	-0.005**	-0.026***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CITIZEN	0.054***	0.073***	0.046***	0.071***	0.055***	0.074***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
dum_2007	0.014***	0.011***	0.016***	0.012***	0.014***	0.011***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
dum_2008	0.025***	0.023***	0.026***	0.024***	0.024***	0.023***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
dum_2009	0.023***	0.022***	0.025***	0.022***	0.023***	0.022***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
dum_2010	-0.002	-0.004	4.68e-06	-0.003	-0.00174	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	0.780***	0.796***	0.774***	0.795***	0.782***	0.797***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Observations	170,121	170,121	170,121	170,121	170,121	170,121
R-squared	0.128	0.188	0.108	0.185	0.131	0.191

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.
Estimation Results – How Mental Health Status Affects the Likelihood of Working Full Time

VARIABLES	(1) Work Full Time	(2) Work Full Time	(3) Work Full Time	(4) Work Full Time	(5) Work Full Time	(6) Work Full Time
EMOTIONAL	-0.385***	-0.212***	-	-	-0.377***	-0.203***
	(0.008)	(0.008)			(0.008)	(0.008)
PSYCHOLOGICAL	-	-	-0.419***	-0.384***	-0.346***	-0.348***
			(0.021)	(0.021)	(0.021)	(0.021)
VISION	-	-0.036***	-	-0.063***	-	-0.037***
		(0.013)		(0.013)		(0.013)
HEARING	-	-0.010	-	-0.043**	-	-0.013
		(0.019)		(0.019)		(0.019)
SUBABUSE	-	-0.216***	-	-0.244***	-	-0.209**
		(0.082)		(0.082)		(0.082)
MENTALRE	-	-0.357***	-	-0.361***	-	-0.355***
		(0.015)		(0.015)		(0.015)
PHYSICAL	-	-0.198***	-	-0.213***	-	-0.199***
		(0.005)		(0.005)		(0.005)
CHRONIC	-	-0.203***	-	-0.223***	-	-0.203***
		(0.005)		(0.005)		(0.005)
OTHERCON	-	-0.183***	-	-0.196***	-	-0.182***
		(0.006)		(0.006)		(0.006)
AGE35_44	0.031***	0.039***	0.027***	0.038***	0.031***	0.039***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
AGE45_54	0.026***	0.050***	0.020***	0.049***	0.026***	0.050***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
AGE55_64	-0.146***	-0.099***	-0.154***	-0.098***	-0.147***	-0.099***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
NOHSGRAD	-0.111***	-0.092***	-0.118***	-0.093***	-0.111***	-0.092***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
SOMECOL	0.037***	0.031***	0.037***	0.030***	0.037***	0.031***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
DEG	0.133***	0.115***	0.138***	0.116***	0.132***	0.115***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
HISPANIC	0.030***	0.020***	0.033***	0.020***	0.029***	0.019***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
BLACK	-0.013***	-0.007**	-0.012***	-0.007*	-0.013***	-0.008**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
ASIAN	0.003	-0.004	0.005	-0.004	0.002	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
OTHER	-0.075***	-0.058***	-0.085***	-0.061***	-0.075***	-0.058***
	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)
FEM	-0.240***	-0.239***	-0.244***	-0.241***	-0.240***	-0.239***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
MARITAL	0.024***	0.006***	0.033***	0.009***	0.023***	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CITIZEN	0.055***	0.071***	0.049***	0.070***	0.056***	0.072***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
dum_2007	0.048***	0.046***	0.050***	0.046***	0.048***	0.046***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
dum_2008	0.041***	0.040***	0.043***	0.041***	0.041***	0.040***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
dum_2009	-0.005	-0.006*	-0.004	-0.006*	-0.005	-0.006*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
dum_2010	-0.009***	-0.011***	-0.008**	-0.010***	-0.009***	-0.011***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	0.562***	0.576***	0.557***	0.575***	0.564***	0.578***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Observations	170,121	170,121	170,121	170,121	170,121	170,121
R-squared	0.127	0.160	0.116	0.158	0.128	0.161

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.
Estimation Results – How Mental Illness Affects the Average Number of Hours Worked per Week

VARIABLES	(1) Hours per Week	(2) Hours per Week	(3) Hours per Week	(4) Hours per Week	(5) Hours per Week	(6) Hours per Week
EMOTIONAL	-20.31***	-11.35***	-	-	-19.86***	-10.88***
	(0.323)	(0.329)			(0.323)	(0.329)
PSYCHOLOGICAL	-	-	-22.05***	-20.21***	-18.19***	-18.25***
			(0.911)	(0.878)	(0.903)	(0.878)
VISION	-	-1.976***	-	-3.438***	-	-2.037***
		(0.559)		(0.559)		(0.559)
HEARING	-	-0.364	-	-2.117***	-	-0.507
		(0.797)		(0.797)		(0.796)
SUBABUSE	-	-13.75***	-	-15.23***	-	-13.37***
		(3.455)		(3.461)		(3.450)
MENTALRE	-	-17.78***	-	-18.02***	-	-17.70***
		(0.648)		(0.649)		(0.647)
PHYSICAL	-	-9.934***	-	-10.75***	-	-9.987***
		(0.229)		(0.229)		(0.229)
CHRONIC	-	-10.66***	-	-11.74***	-	-10.64***
		(0.229)		(0.227)		(0.229)
OTHERCON	-	-9.534***	-	-10.22***	-	-9.499***
		(0.248)		(0.247)		(0.247)
AGE35_44	1.428***	1.856***	1.248***	1.809***	1.431***	1.860***
	(0.133)	(0.129)	(0.134)	(0.129)	(0.132)	(0.129)
AGE45_54	1.025***	2.253***	0.699***	2.207***	1.015***	2.244***
	(0.134)	(0.131)	(0.135)	(0.131)	(0.134)	(0.131)
AGE55_64	-7.620***	-5.158***	-8.030***	-5.122***	-7.641***	-5.178***
	(0.145)	(0.144)	(0.146)	(0.144)	(0.145)	(0.143)
NOHSGRAD	-5.037***	-4.049***	-5.365***	-4.110***	-4.999***	-4.011***
	(0.161)	(0.157)	(0.163)	(0.157)	(0.161)	(0.157)
SOMECOL	2.282***	1.965***	2.296***	1.945***	2.274***	1.957***
	(0.148)	(0.144)	(0.149)	(0.144)	(0.148)	(0.144)
DEG	6.340***	5.443***	6.586***	5.476***	6.310***	5.413***
	(0.123)	(0.120)	(0.124)	(0.120)	(0.122)	(0.119)
HISPANIC	0.119	-0.418***	0.270*	-0.400***	0.0882	-0.449***
	(0.144)	(0.140)	(0.145)	(0.140)	(0.144)	(0.140)
BLACK	-1.953***	-1.651***	-1.883***	-1.584***	-1.962***	-1.661***
	(0.146)	(0.142)	(0.147)	(0.142)	(0.145)	(0.141)
ASIAN	-2.131***	-2.476***	-2.018***	-2.459***	-2.146***	-2.491***
	(0.203)	(0.198)	(0.205)	(0.198)	(0.203)	(0.197)
OTHER	-4.106***	-3.223***	-4.676***	-3.416***	-4.132***	-3.246***
	(0.527)	(0.513)	(0.533)	(0.514)	(0.527)	(0.512)
FEM	-9.929***	-9.859***	-10.11***	-9.954***	-9.941***	-9.873***
	(0.096)	(0.094)	(0.097)	(0.094)	(0.096)	(0.094)
MARITAL	0.587***	-0.310***	1.058***	-0.182*	0.520***	-0.377***
	(0.104)	(0.101)	(0.105)	(0.102)	(0.104)	(0.101)
CITIZEN	2.258***	3.094***	1.926***	3.016***	2.300***	3.136***
	(0.168)	(0.164)	(0.170)	(0.164)	(0.168)	(0.164)
dum_2007	1.706***	1.592***	1.803***	1.630***	1.706***	1.592***
	(0.154)	(0.149)	(0.155)	(0.150)	(0.153)	(0.149)
dum_2008	1.603***	1.534***	1.676***	1.558***	1.593***	1.523***
	(0.153)	(0.148)	(0.154)	(0.149)	(0.152)	(0.148)
dum_2009	-0.041	-0.097	0.015	-0.079	-0.048	-0.104
	(0.142)	(0.138)	(0.144)	(0.138)	(0.142)	(0.138)
dum_2010	-0.405***	-0.492***	-0.334**	-0.468***	-0.412***	-0.500***
	(0.141)	(0.137)	(0.143)	(0.138)	(0.141)	(0.137)
Constant	30.80***	31.51***	30.55***	31.48***	30.88***	31.59***
	(0.239)	(0.232)	(0.241)	(0.233)	(0.239)	(0.232)
Observations	170,121	170,121	170,121	170,121	170,121	170,121
R-squared	0.146	0.194	0.129	0.190	0.148	0.196

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6.
Estimation Results – How Mental Illness Affects Earnings

VARIABLES	(1) Earnings	(2) Earnings	(3) Earnings	(4) Earnings	(5) Earnings	(6) Earnings
EMOTIONAL	-5,344***	-3,056***	-	-	-5,236***	-2,951***
	(675.2)	(692.9)			(676.2)	(693.9)
PSYCHOLOGICAL	-	-	-6,835***	-6,142***	-6,002***	-5,690***
			(2,007)	(2,005)	(2,009)	(2,008)
VISION	-	-1,910	-	-2,277*	-	-1,940
		(1,199)		(1,196)		(1,199)
HEARING	-	-1,611	-	-1,963	-	-1,637
		(1,560)		(1,558)		(1,560)
SUBABUSE	-	975.9	-	69.10	-	928.4
		(5,925)		(5,922)		(5,925)
MENTALRE	-	-12,289***	-	-12,266***	-	-12,186***
		(1,494)		(1,494)		(1,494)
PHYSICAL	-	-2,470***	-	-2,604***	-	-2,481***
		(393.0)		(392.0)		(393.0)
CHRONIC	-	-2,894***	-	-3,089***	-	-2,891***
		(428.7)		(426.2)		(428.7)
OTHERCON	-	-3,080***	-	-3,240***	-	-3,071***
		(456.9)		(455.2)		(456.9)
HRWLW	347.3***	342.0***	348.7***	342.4***	347.1***	341.9***
	(3.763)	(3.773)	(3.759)	(3.771)	(3.764)	(3.773)
MOWLY	2,336***	2,316***	2,349***	2,321***	2,335***	2,314***
	(26.59)	(26.61)	(26.54)	(26.58)	(26.60)	(26.62)
AGE35_44	6,092***	6,159***	6,077***	6,155***	6,092***	6,159***
	(155.5)	(155.4)	(155.5)	(155.4)	(155.5)	(155.4)
AGE45_54	7,426***	7,585***	7,404***	7,583***	7,423***	7,583***
	(158.5)	(158.7)	(158.5)	(158.7)	(158.5)	(158.7)
AGE55_64	6,734***	7,016***	6,714***	7,023***	6,729***	7,012***
	(182.8)	(183.9)	(182.8)	(183.9)	(182.8)	(183.9)
NOHSGRAD	-4,236***	-4,210***	-4,245***	-4,214***	-4,235***	-4,209***
	(215.2)	(215.0)	(215.2)	(215.0)	(215.2)	(215.0)
SOMECOL	4,689***	4,669***	4,677***	4,663***	4,688***	4,669***
	(178.9)	(178.8)	(178.9)	(178.8)	(178.9)	(178.8)
DEG	17,039***	16,973***	17,043***	16,972***	17,037***	16,972***
	(147.4)	(147.3)	(147.4)	(147.3)	(147.4)	(147.3)
HISPANIC	-3,957***	-4,024***	-3,943***	-4,021***	-3,961***	-4,028***
	(174.2)	(174.1)	(174.2)	(174.1)	(174.2)	(174.1)
BLACK	-3,744***	-3,767***	-3,737***	-3,765***	-3,746***	-3,770***
	(177.1)	(176.9)	(177.1)	(176.9)	(177.1)	(176.9)
ASIAN	1,459***	1,388***	1,474***	1,390***	1,457***	1,385***
	(246.2)	(246.0)	(246.3)	(246.0)	(246.2)	(246.0)
OTHER	-3,218***	-3,123***	-3,277***	-3,149***	-3,221***	-3,126***
	(675.3)	(674.7)	(675.4)	(674.7)	(675.2)	(674.7)
FEM	-10,624***	-10,639***	-10,632***	-10,645***	-10,627***	-10,642***
	(118.5)	(118.5)	(118.5)	(118.5)	(118.5)	(118.5)
MARITAL	3,293***	3,172***	3,329***	3,183***	3,288***	3,168***
	(124.8)	(124.9)	(124.7)	(124.9)	(124.8)	(124.9)
CITIZEN	6,704***	6,804***	6,677***	6,796***	6,708***	6,808***
	(210.4)	(210.3)	(210.4)	(210.3)	(210.4)	(210.3)
dum_2007	-1,276***	-1,262***	-1,272***	-1,259***	-1,274***	-1,260***
	(185.2)	(185.0)	(185.3)	(185.0)	(185.2)	(185.0)
dum_2008	-206.6	-182.1	-206.5	-179.5	-203.9	-179.5
	(183.2)	(183.0)	(183.2)	(183.0)	(183.2)	(183.0)
dum_2009	688.7***	683.4***	694.0***	686.4***	689.6***	684.3***
	(171.1)	(170.9)	(171.1)	(170.9)	(171.1)	(170.9)
dum_2010	390.4**	386.5**	398.4**	390.2**	390.3**	386.3**
	(171.4)	(171.2)	(171.5)	(171.2)	(171.4)	(171.2)
Constant	-12,354***	-11,808***	-12,568***	-11,880***	-12,325***	-11,780***
	(393.0)	(394.1)	(391.9)	(393.6)	(393.1)	(394.2)
Observations	126,513	126,513	126,513	126,513	126,513	126,513
R-squared	0.391	0.393	0.391	0.393	0.392	0.393

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7.
Estimation Results – How Duration of a Mental Illness Affects the Probability of Participating in the Labor Force

VARIABLES	(1) Work for Pay (Conditional)	(2) Work for Pay (Unconditional)	(3) Work for Pay (Conditional)	(4) Work for Pay (Unconditional)
DURAEMO	-	-0.009***	-	-
		(0.0003)		
DURAPSY	-	-	-	-0.014***
				(0.001)
DURAEMO_m	-0.0004	-	-	-
	(0.0001)			
DURAPSY_m	-	-	0.0002	-
			(0.001)	
EMOTIONAL	-	-	-0.025	-0.243***
			(0.045)	(0.007)
PSYCHOLOGICAL	-0.100	-0.434***	-	-
	(0.039)	(0.018)		
VISION	-0.008	-0.083***	-0.083	-0.068***
	(0.024)	(0.011)	(0.140)	(0.011)
HEARING	0.014	-0.008	-0.308	0.003
	(0.031)	(0.016)	(0.295)	(0.016)
SUBABUSE	0.323**	-0.299***	-0.257	-0.268***
	(0.152)	(0.071)	(0.400)	(0.071)
MENTALRE	-0.050	-0.409***	0.132	-0.410***
	(0.043)	(0.013)	(0.123)	(0.013)
PHYSICAL	-0.027*	-0.226***	-0.103	-0.218***
	(0.016)	(0.005)	(0.069)	(0.005)
CHRONIC	-0.054***	-0.263***	-0.054	-0.253***
	(0.016)	(0.005)	(0.054)	(0.005)
OTHERCON	-0.017	-0.220***	-0.039	-0.214***
	(0.016)	(0.005)	(0.057)	(0.005)
AGE35_44	-0.106***	0.016***	-0.057	0.016***
	(0.022)	(0.003)	(0.049)	(0.003)
AGE45_54	-0.155***	0.013***	-0.136***	0.013***
	(0.021)	(0.003)	(0.050)	(0.003)
AGE55_64	-0.224***	-0.121***	-0.223***	-0.122***
	(0.022)	(0.003)	(0.059)	(0.003)
NOHSGRAD	-0.058***	-0.089***	-0.095*	-0.089***
	(0.018)	(0.003)	(0.048)	(0.003)
SOMECOL	0.095***	0.057***	0.067	0.057***
	(0.019)	(0.003)	(0.053)	(0.003)
DEG	0.188***	0.108***	0.177***	0.107***
	(0.019)	(0.002)	(0.053)	(0.002)
HISPANIC	-0.041**	0.002	-0.041	0.002
	(0.020)	(0.003)	(0.057)	(0.003)
BLACK	-0.016	-0.024***	-0.052	-0.024***
	(0.018)	(0.003)	(0.047)	(0.003)
ASIAN	-0.063	-0.070***	-0.131	-0.070***
	(0.046)	(0.004)	(0.130)	(0.004)
OTHER	0.011	-0.055***	-0.094	-0.054***
	(0.045)	(0.011)	(0.181)	(0.011)
FEM	-0.001	-0.150***	-0.029	-0.149***
	(0.014)	(0.002)	(0.038)	(0.002)
MARITAL	0.030**	-0.024***	0.113***	-0.025***
	(0.014)	(0.002)	(0.043)	(0.002)
CITIZEN	-0.046	0.072***	-0.067	0.073***
	(0.041)	(0.003)	(0.130)	(0.003)
dum_2007	0.018	0.012***	0.076	0.012***
	(0.021)	(0.003)	(0.056)	(0.003)
dum_2008	0.046**	0.023***	0.140**	0.023***
	(0.021)	(0.003)	(0.059)	(0.003)
dum_2009	0.012	0.022***	0.087	0.022***
	(0.019)	(0.003)	(0.054)	(0.003)
dum_2010	0.002	-0.004	0.043	-0.004
	(0.019)	(0.003)	(0.054)	(0.003)
Constant	0.405***	0.797***	0.313**	0.797***
	(0.048)	(0.005)	(0.144)	(0.005)
Observations	3,802	170,121	483	170,121
R-squared	0.096	0.189	0.139	0.190

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8.
Estimation Results – How Duration of a Mental Illness Affects the Likelihood of Working Full Time

VARIABLES	(1) Work Full Time (Conditional)	(2) Work Full Time (Unconditional)	(3) Work Full Time (Conditional)	(4) Work Full Time (Unconditional)
DURAEMO	-	-0.007***	-	-
		(0.0003)		
DURAPSY	-	-	-	-0.011***
				(0.001)
DURAEMO_m	-0.001	-	-	-
	(0.0003)			
DURAPSY_m	-	-	0.001	-
			(0.001)	
EMOTIONAL	-	-	-0.068**	-0.206***
			(0.029)	(0.008)
PSYCHOLOGICAL	-0.071***	-0.360***	-	-
	(0.025)	(0.021)		
VISION	-0.001	-0.050***	-0.004	-0.037***
	(0.016)	(0.013)	(0.090)	(0.013)
HEARING	0.017	-0.022	-0.132	-0.012
	(0.020)	(0.019)	(0.191)	(0.019)
SUBABUSE	0.341***	-0.229***	-0.193	-0.203**
	(0.098)	(0.082)	(0.258)	(0.082)
MENTALRE	-0.052*	-0.355***	0.071	-0.356***
	(0.028)	(0.015)	(0.080)	(0.015)
PHYSICAL	-0.009	-0.205***	-0.042	-0.198***
	(0.010)	(0.005)	(0.045)	(0.005)
CHRONIC	-0.035***	-0.211***	-0.030	-0.202***
	(0.010)	(0.005)	(0.035)	(0.005)
OTHERCON	-0.003	-0.188***	0.031	-0.183***
	(0.010)	(0.006)	(0.037)	(0.006)
AGE35_44	-0.019	0.039***	-0.086***	0.039***
	(0.014)	(0.003)	(0.031)	(0.003)
AGE45_54	-0.033**	0.050***	-0.071**	0.050***
	(0.013)	(0.003)	(0.033)	(0.003)
AGE55_64	-0.062***	-0.098***	-0.127***	-0.099***
	(0.014)	(0.003)	(0.038)	(0.003)
NOHSGRAD	-0.009	-0.092***	0.004	-0.092***
	(0.011)	(0.004)	(0.031)	(0.004)
SOMECOL	0.020*	0.031***	0.010	0.031***
	(0.012)	(0.003)	(0.034)	(0.003)
DEG	0.113***	0.115***	0.232***	0.115***
	(0.012)	(0.003)	(0.034)	(0.003)
HISPANIC	0.010	0.019***	0.024	0.019***
	(0.013)	(0.003)	(0.037)	(0.003)
BLACK	-0.009	-0.008**	-0.025	-0.007**
	(0.011)	(0.003)	(0.031)	(0.003)
ASIAN	6.37e-05	-0.004	-0.076	-0.004
	(0.029)	(0.005)	(0.084)	(0.005)
OTHER	-0.029	-0.058***	-0.053	-0.058***
	(0.029)	(0.012)	(0.117)	(0.012)
FEM	-0.006	-0.240***	-0.057**	-0.239***
	(0.009)	(0.002)	(0.025)	(0.002)
MARITAL	0.030***	0.006***	0.036	0.006**
	(0.009)	(0.002)	(0.028)	(0.002)
CITIZEN	-0.007	0.071***	-0.031	0.072***
	(0.027)	(0.004)	(0.084)	(0.004)
dum_2007	0.027**	0.046***	-0.005	0.046***
	(0.014)	(0.004)	(0.036)	(0.004)
dum_2008	0.014	0.040***	0.053	0.040***
	(0.013)	(0.004)	(0.038)	(0.003)
dum_2009	0.002	-0.006*	-0.008	-0.006*
	(0.012)	(0.003)	(0.035)	(0.003)
dum_2010	-0.005	-0.011***	0.003	-0.011***
	(0.012)	(0.003)	(0.035)	(0.003)
Constant	0.108***	0.577***	0.143	0.577***
	(0.031)	(0.005)	(0.093)	(0.006)
Observations	3,802	170,121	483	170,121
R-squared	0.057	0.160	0.182	0.161

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9.
Estimation Results – How Duration of a Mental Illness Affects the Average Number of Hours Worked per Week

VARIABLES	(1) Hours per Week (Conditional)	(2) Hours per Week (Unconditional)	(3) Hours per Week (Conditional)	(4) Hours per Week (Unconditional)
DURAEMO	-	-0.385***	-	-
		(0.015)		
DURAPSY	-	-	-	-0.565***
				(0.035)
DURAEMO_m	-0.019	-	-	-
	(0.016)			
DURAPSY_m	-	-	0.091*	-
			(0.046)	
EMOTIONAL	-	-	-3.653**	-11.06***
			(1.504)	(0.329)
PSYCHOLOGICAL	-4.527***	-18.89***	-	-
	(1.253)	(0.878)		
VISION	-0.227	-2.701***	-0.327	-2.011***
	(0.779)	(0.558)	(4.691)	(0.559)
HEARING	1.062	-1.003	-8.195	-0.456
	(1.006)	(0.797)	(9.895)	(0.797)
SUBABUSE	11.28**	-14.44***	-13.22	-13.06***
	(4.919)	(3.455)	(13.41)	(3.452)
MENTALRE	-2.452*	-17.69***	1.232	-17.73***
	(1.389)	(0.648)	(4.127)	(0.647)
PHYSICAL	-0.869*	-10.34***	-2.523	-9.956***
	(0.503)	(0.229)	(2.314)	(0.229)
CHRONIC	-1.968***	-11.09***	-2.371	-10.63***
	(0.503)	(0.228)	(1.806)	(0.229)
OTHERCON	-0.721	-9.787***	0.113	-9.520***
	(0.511)	(0.247)	(1.917)	(0.248)
AGE35_44	-1.235*	1.847***	-2.782*	1.864***
	(0.697)	(0.129)	(1.626)	(0.129)
AGE45_54	-2.523***	2.259***	-4.480***	2.256***
	(0.664)	(0.131)	(1.691)	(0.131)
AGE55_64	-4.752***	-5.087***	-7.105***	-5.154***
	(0.707)	(0.144)	(1.980)	(0.143)
NOHSGRAD	-0.729	-4.049***	-1.105	-4.029***
	(0.566)	(0.157)	(1.619)	(0.157)
SOMECOL	2.170***	1.955***	1.498	1.955***
	(0.596)	(0.144)	(1.769)	(0.144)
DEG	6.793***	5.447***	12.19***	5.426***
	(0.599)	(0.120)	(1.768)	(0.119)
HISPANIC	-0.371	-0.460***	-0.187	-0.433***
	(0.631)	(0.140)	(1.908)	(0.140)
BLACK	-1.123**	-1.661***	-1.221	-1.659***
	(0.572)	(0.142)	(1.581)	(0.141)
ASIAN	0.439	-2.494***	-7.603*	-2.482***
	(1.478)	(0.198)	(4.352)	(0.197)
OTHER	-1.549	-3.267***	-1.523	-3.233***
	(1.448)	(0.513)	(6.055)	(0.512)
FEM	0.266	-9.920***	-2.651**	-9.872***
	(0.441)	(0.094)	(1.283)	(0.094)
MARITAL	1.376***	-0.312***	253	-0.354***
	(0.454)	(0.102)	(1.431)	(0.101)
CITIZEN	-0.803	3.064***	-5.061	3.120***
	(1.336)	(0.164)	(4.372)	(0.164)
dum_2007	1.466**	1.598***	-0.119	1.596***
	(0.682)	(0.149)	(1.884)	(0.149)
dum_2008	1.446**	1.533***	1.838	1.523***
	(0.665)	(0.148)	(1.974)	(0.148)
dum_2009	-0.033	-0.103	-1.330	-0.105
	(0.610)	(0.138)	(1.797)	(0.138)
dum_2010	0.088	-0.492***	-0.703	-0.495***
	(0.612)	(0.137)	(1.796)	(0.137)
Constant	7.886***	31.56***	11.89**	31.56***
	(1.559)	(0.232)	(4.812)	(0.232)
Observations	3,802	170,121	483	170,121
R-squared	0.084	0.193	0.193	0.195

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table !0.
Estimation Results – How Duration of a Mental Illness Affects Earnings

VARIABLES	(1) Earnings (Conditional)	(2) Earnings (Unconditional)	(3) Earnings (Conditional)	(4) Earnings (Unconditional)
DURAEMO	-	-170.7***	-	-
		(35.08)		
DURAPSY	-	-	-	-390.0***
				(85.78)
DURAEMO_m	-56.66	-	-	-
	(42.95)			
DURAPSY_m	-	-	-266.3*	-
			(135.2)	
EMOTIONAL	-	-	-3,474	-2,928***
			(4,643)	(693.7)
PSYCHOLOGICAL	-2,330	-5,742***	-	-
	(3,718)	(2,007)		
VISION	-1,346	-1,943	-	-1,948
	(2,343)	(1,198)		(1,199)
HEARING	4,841*	-1,581	-	-1,644
	(2,858)	(1,560)		(1,559)
SUBABUSE	5,585	699.1	-	919.0
	(8,009)	(5,923)		(5,925)
MENTALRE	-6,781	-12,125***	-16,897*	-12,140***
	(4,515)	(1,495)	(10,051)	(1,494)
PHYSICAL	1,032	-2,505***	-5,352	-2,480***
	(1,363)	(392.5)	(11,590)	(393.0)
CHRONIC	591.0	-2,920***	5,385	-2,889***
	(1,370)	(427.6)	(6,751)	(428.7)
OTHERCON	-324.1	-3,072***	7,699	-3,066***
	(1,404)	(456.4)	(6,580)	(456.9)
HRWLW	247.8***	342.0***	234.8**	341.9***
	(31.76)	(3.772)	(102.2)	(3.773)
MOWLY	1,714***	2,315***	2,037***	2,315***
	(154.8)	(26.60)	(536.5)	(26.61)
AGE35_44	-1,107	6,161***	2,031	6,159***
	(1,506)	(155.4)	(4,231)	(155.4)
AGE45_54	2,242	7,589***	3,532	7,583***
	(1,500)	(158.7)	(4,855)	(158.7)
AGE55_64	2,522	7,021***	-3,454	7,013***
	(1,767)	(183.9)	(6,831)	(183.9)
NOHSGRAD	-3,714**	-4,205***	976.8	-4,210***
	(1,797)	(215.0)	(5,838)	(214.9)
SOMECOL	2,383	4,666***	2,104	4,666***
	(1,500)	(178.8)	(5,074)	(178.8)
DEG	7,135***	16,974***	13,171***	16,972***
	(1,443)	(147.3)	(4,609)	(147.3)
HISPANIC	-155.4	-4,033***	1,456	-4,028***
	(1,770)	(174.1)	(5,551)	(174.1)
BLACK	865.9	-3,773***	-2,397	-3,769***
	(1,486)	(176.9)	(5,250)	(176.9)
ASIAN	-794.2	1,385***	29,453*	1,385***
	(3,846)	(246.0)	(15,722)	(246.0)
OTHER	2,838	-3,119***	-21,165	-3,132***
	(3,580)	(674.7)	(17,443)	(674.7)
FEM	-2,691**	-10,644***	-542.7	-10,643***
	(1,150)	(118.5)	(3,723)	(118.5)
MARITAL	3,351***	3,168***	12,989***	3,167***
	(1,150)	(124.9)	(3,772)	(124.9)
CITIZEN	-1,030	6,803***	-6,621	6,808***
	(3,592)	(210.3)	(14,987)	(210.3)
dum_2007	-2,860	-1,259***	986.3	-1,258***
	(1,758)	(185.0)	(5,776)	(185.0)
dum_2008	-2,479	-177.3	2,842	-178.7
	(1,658)	(183.0)	(5,368)	(183.0)
dum_2009	-544.4	684.9***	1,498	683.6***
	(1,594)	(170.9)	(5,417)	(170.9)
dum_2010	330.9	388.5**	-1,340	388.2**
	(1,616)	(171.2)	(5,930)	(171.2)
Constant	-425.2	-11,795***	-2,196	-11,782***
	(4,159)	(393.9)	(16,622)	(394.2)
Observations	880	126,513	104	126,513
R-squared	0.378	0.393	0.580	0.393

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11.
Variable Definitions

Variable	Definition
Health Conditions	
EMOTIONAL	-1 if has emotional problems, 0 otherwise
PSYCHOLOGICAL	-1 if has psychological problems, 0 otherwise
DURAEMO	-Number of years with emotional problems, unconditional on having a mental illness
DURAPSY	-Number of years with psychological problems, unconditional on having a mental illness
DURAEMO_m	-Number of years with emotional problems, conditional on having a mental illness
DURAPSY_m	-Number of years with psychological problems, conditional on having a mental illness
VISION	-1 if has vision problems, 0 otherwise
HEARING	-1 if has hearing problems, 0 otherwise
SUBABUSE	-1 if has substance abuse problems, 0 otherwise
MENTALRE	-1 if mentally challenged, 0 otherwise
PHYSICAL	-1 if has physical disabilities, 0 otherwise
CHRONIC	-1 if has chronic diseases, 0 otherwise
OTHERCON	-1 if has other health conditions, 0 otherwise
Labor Supply	
HRWLW	-Number of hours worked in the last calendar week
MOWLY	-Number of month worked in the last calendar year
Age	
AGE25_44	-1 if between the age of 25 and 34, 0 otherwise
AGE35_44	-1 if between the age of 35 and 44, 0 otherwise
AGE45_54	-1 if between the age of 45 and 54, 0 otherwise
AGE55_64	-1 if between the age of 55 and 64, 0 otherwise
Education	
NOHSGRAD	-1 if did not graduate high school, 0 otherwise
HSGRAD	-1 if graduated high school, 0 otherwise
SOMECOL	-1 if attended some college, 0 otherwise
DEG	-1 if attained either an Associate's Degree or Above, 0 otherwise
Race/Ethnicity	
WHITE	-1 if non-Hispanic White, 0 otherwise
HISPANIC	-1 if Hispanic, 0 otherwise
BLACK	-1 if non-Hispanic Black, 0 otherwise
ASIAN	-1 if non-Hispanic Asian, 0 otherwise
OTHER	-1 if non-Hispanic other race, 0 otherwise
Gender	
MALE	-1 if male, 0 otherwise
FEM	-1 if female, 0 otherwise
Other Explanatory Variables	
MARITAL	-1 if married, 0 otherwise
CITIZEN	-1 if a U.S. citizen, 0 otherwise
Year	
dum_2007	-1 if survey year is 2007, 0 otherwise
dum_2008	-1 if survey year is 2008, 0 otherwise
dum_2009	-1 if survey year is 2009, 0 otherwise
dum_2010	-1 if survey year is 2010, 0 otherwise
dum_2011	-1 if survey year is 2011, 0 otherwise